

A photograph of a forest stream with moss-covered logs and dense green foliage. The water is clear and flows over rocks, creating small splashes. The surrounding vegetation is thick and vibrant green, with sunlight filtering through the canopy.

**Green Diamond Resource Company**

**California Timberlands Division**

**Aquatic Habitat  
Conservation Plan**

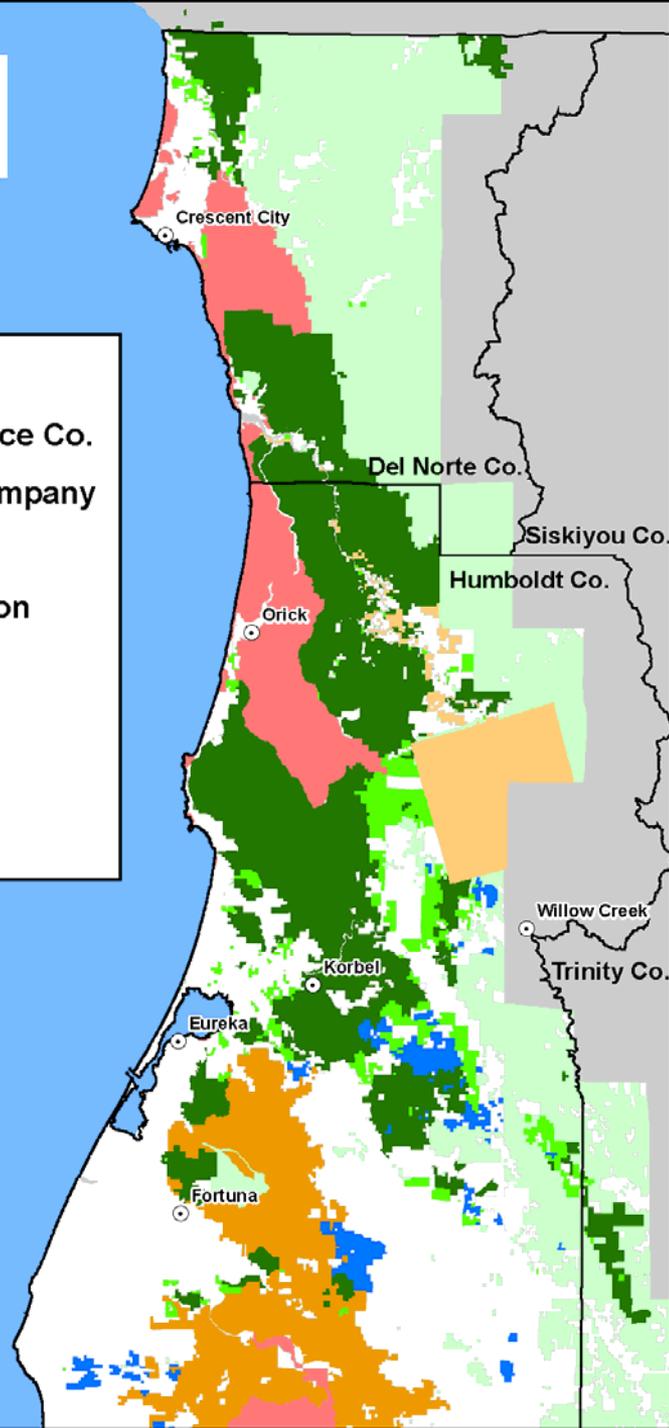
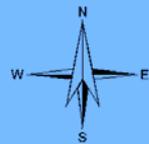
**Candidate Conservation  
Agreement with Assurances**

# Original Purpose of the Plan

- Provide coverage for incidental take of listed aquatic species under ESA
- Provide coverage for unlisted species that could become listed
- Flexibility in application of forest practices and certainty in long-term planning (50 year plan)
- Use this planning document with other permitting processes

**OWNERSHIPS**

-  Green Diamond Resource Co.
-  Humboldt Redwood Company
-  Sierra Pacific Ind
-  Hoopa/Yurok Reservation
-  National/State Parks
-  USFS/BLM
-  Other Industrial Private
-  Other Non-Ind Private

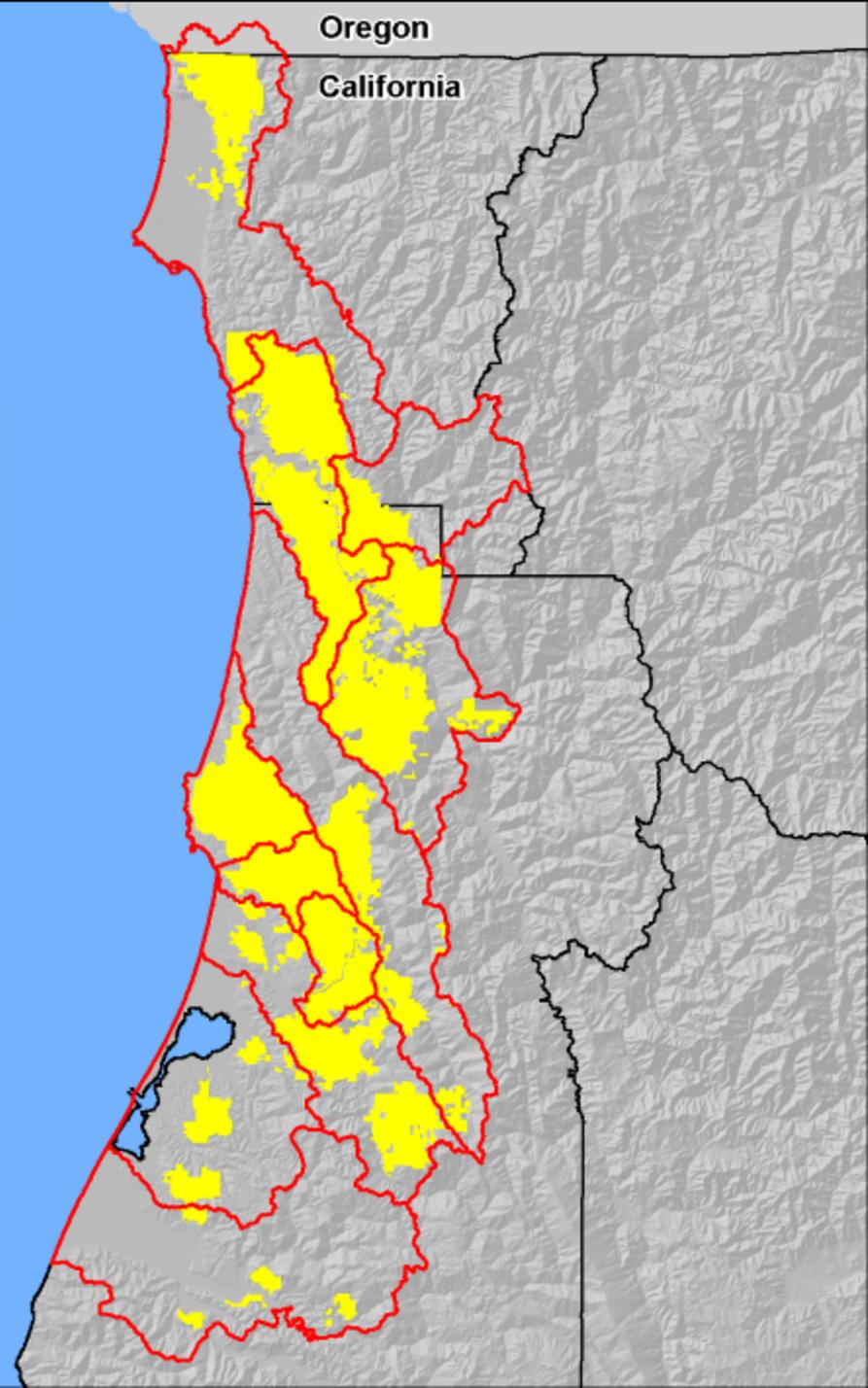


Oregon

California

 Initial Plan Area (406,962 acres)

 11 Hydrographic Planning Areas



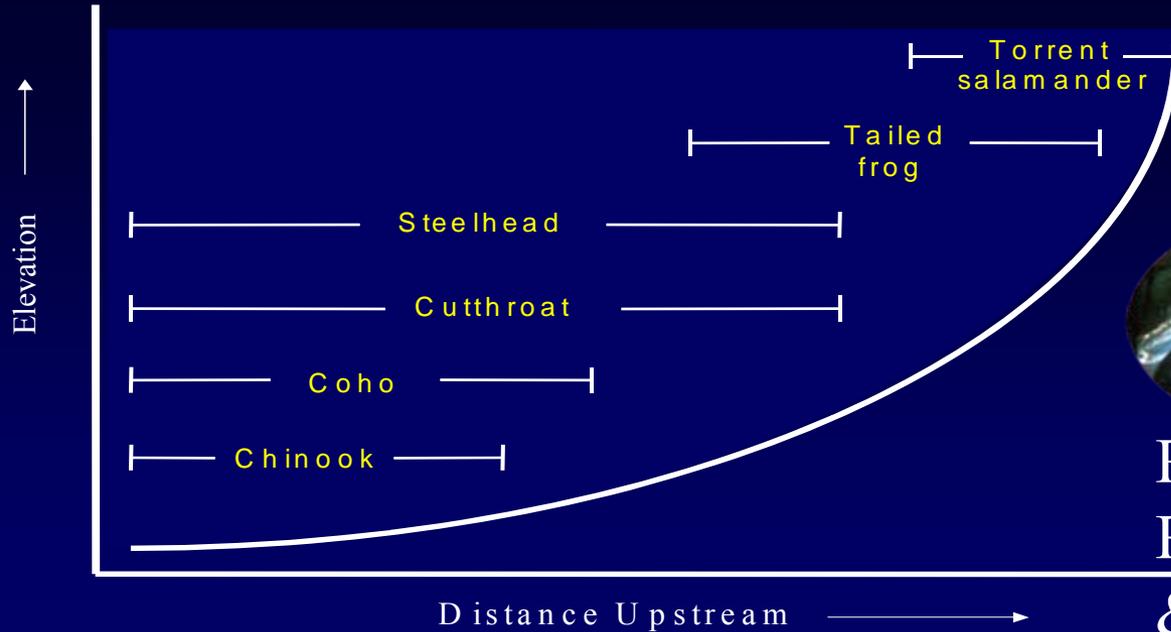
# Species Covered



Torrent Salamander



Tailed frog



Resident  
Rainbow Trout  
& Steelhead



Chinook



Coho



Cutthroat

# Potential Operational Impacts to the Covered Species

- Alter hydrology
- Increase sediment delivery from surface erosion and mass wasting
- Alter LWD recruitment
- Alter water temperature and nutrient inputs
- Create barriers to fish passage
- Direct harm to the species

# Biological Goals and Objectives

- Maintain cool water temperatures
- Minimize and mitigate sediment inputs
- Provide LWD recruitment
- Maintain or increase amphibian populations
- Monitor and adapt the Plan

# Conservation Strategy

- Stream Protection Conservation Measures
- Slope Stability Measures
- Road Program
- Harvest-related Ground Disturbance
- Monitoring and Adaptive Management

# Class I RMZ Protection

- Single entry into RMZ during life of plan
- 150 foot minimum width
- 85% overstory canopy on inner 50-70 feet
- 70% overstory canopy on outer zone
- No trees harvested judged likely to recruit
- Salvage in outer zone only when non-functional criteria are met
- Retain all safe snags

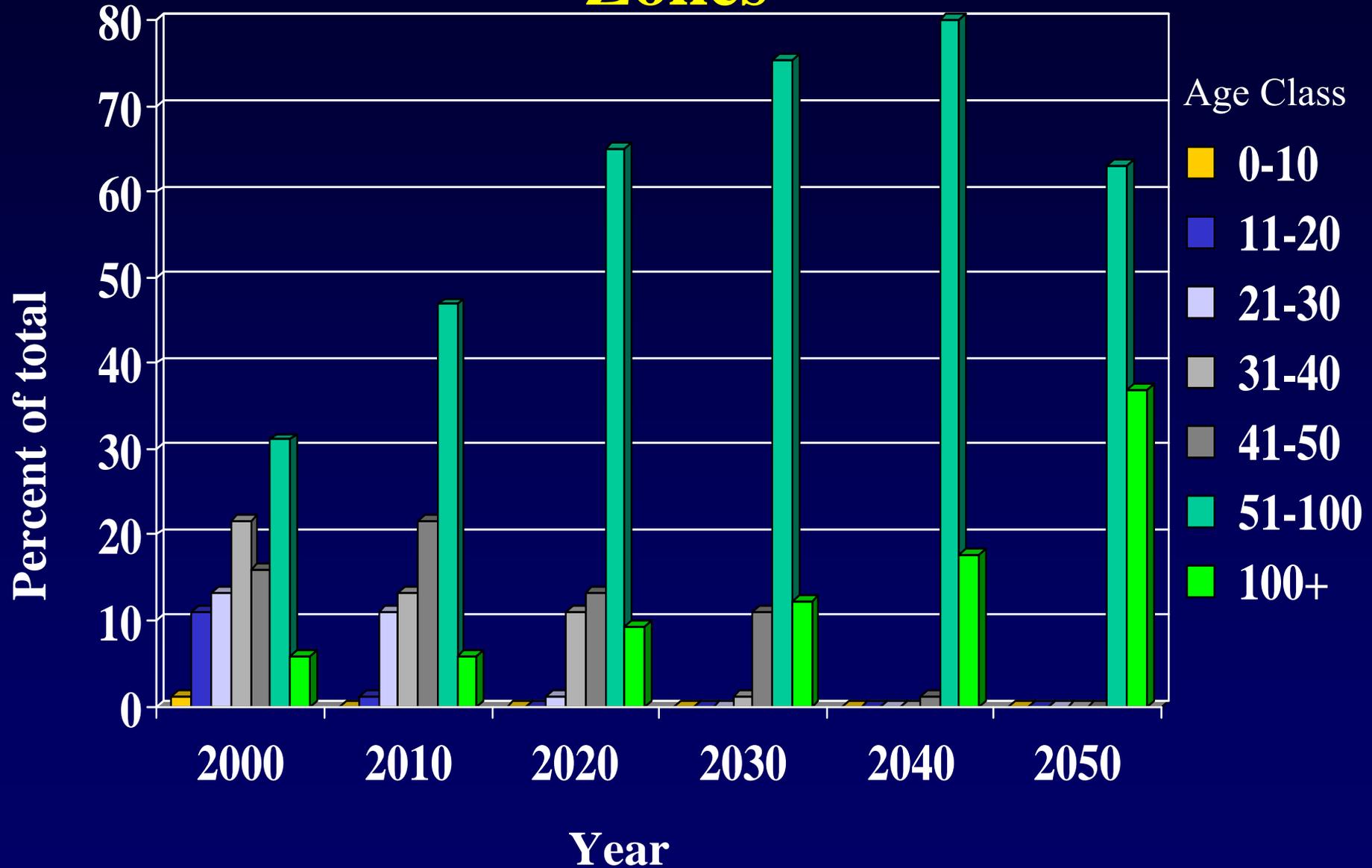


# Class II RMZ Protection

- Single entry into RMZ during the life of the plan
- Variable 75 - 100 foot width
- 85% overstory canopy on inner 30 feet
- 70% overstory canopy on outer zone
- No trees harvested that are essential for bank stability
- Salvage in outer zone only when non-functional criteria are met
- Retain all safe snags



# Age Distribution of Trees in Protection Zones



# Class III Protections

- Tier A – (side slopes < HPA Group threshold)
  - 30 foot EEZ and retain LWD
- Tier B – (side slopes > HPA Group threshold)
  - 50 foot EEZ
  - retain all hardwoods, sub-merchantable conifers, and average 1 merchantable conifer every 50 feet
  - retain conifers that are essential for bank stability or act as channel controls
- Modified Tier A – (within selected GD tracts and in coho planning watersheds where highly erodible soils exist)
  - 30 foot EEZ and retain LWD
  - retain all sub-merchantable conifers
  - retain 15 ft<sup>2</sup> of basal area of hardwoods per acre
  - Retain all channel trees

# Protection for Unique Channel Types

## Channel Migration Zones:

- Map all CMZs and floodplains throughout ownership for the lower depositional reaches of Class I channels
- The protection zone begins at the outer edge of the CMZ
- No harvest within CMZ except to promote the growth of remaining conifers

## Floodplains:

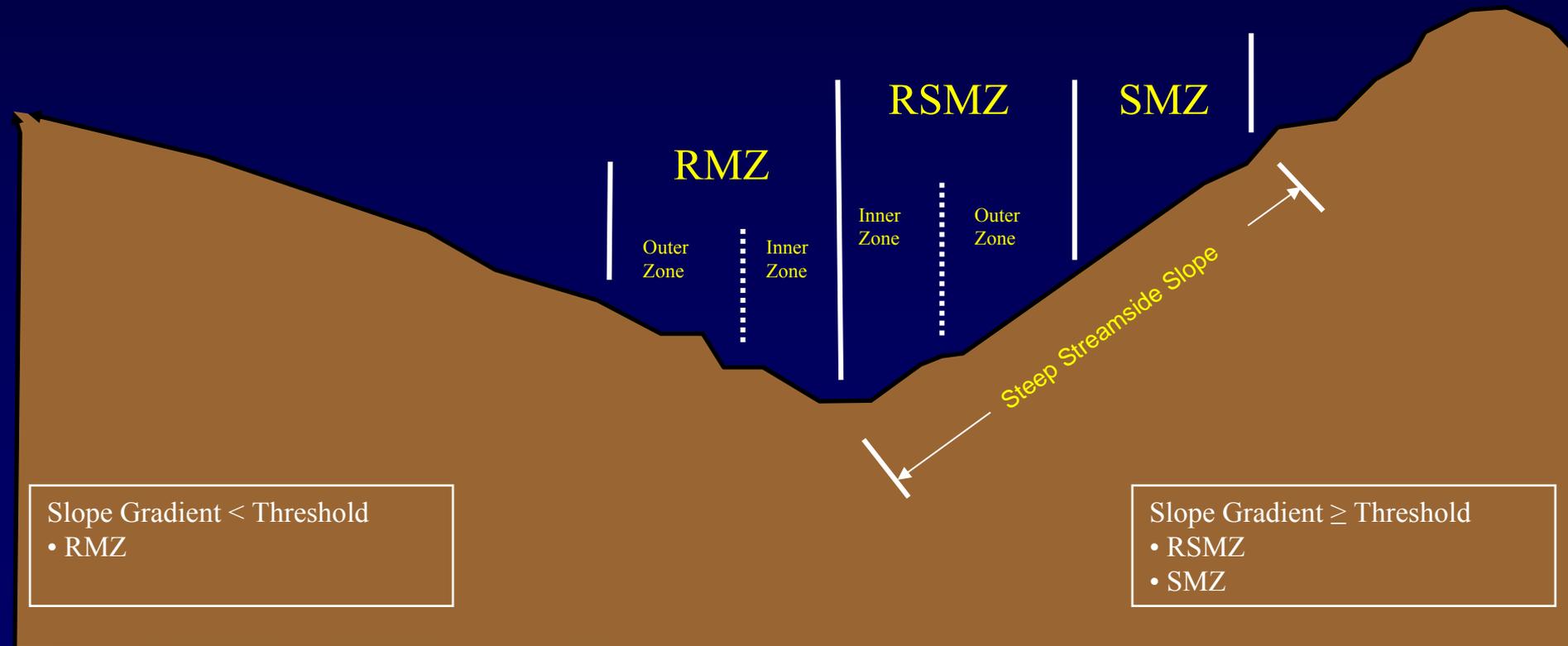
- Extend protection zone to cover entire floodplain plus 30-50 feet depending on slope class

# Geologic Measures

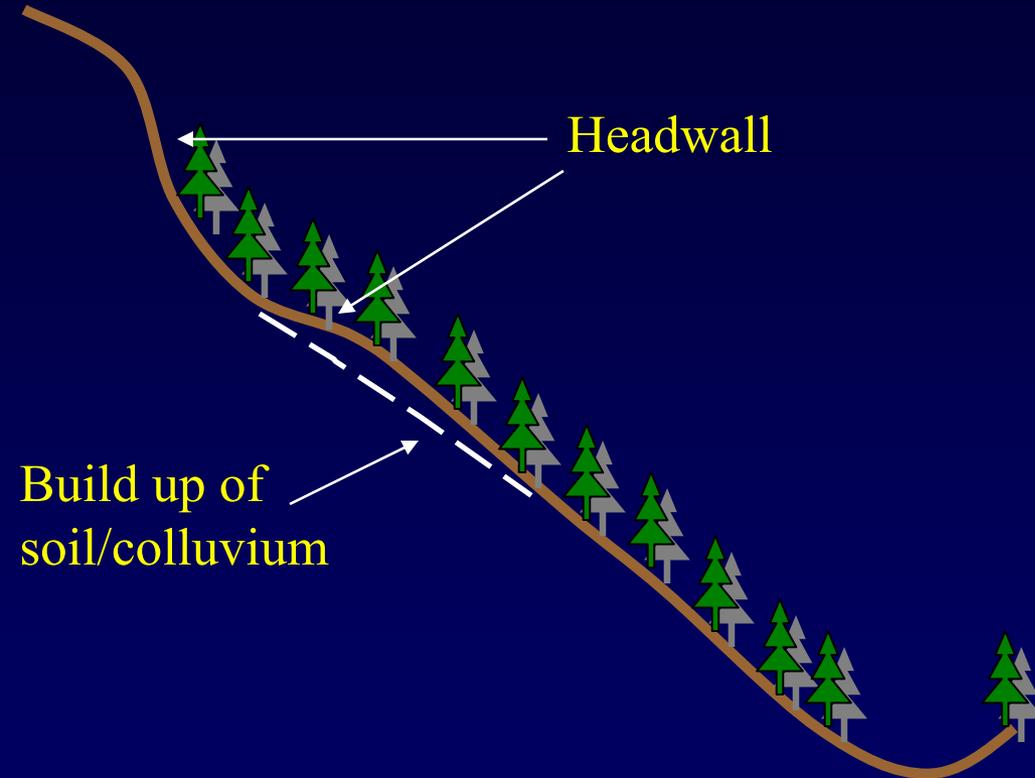
- Slope protection measures provided on:
  - Steep Streamside Slopes (SSS)
  - Headwall Swales
  - Deep-seated Landslides
  - Shallow Landslides with delivery potential
- Protections range from selection harvest to no-cut
- Landslide assessments will be conducted in 7 years (SSS delineation), 15 years (SSS effectiveness assessment), and 20 years (comprehensive mass wasting assessment).

# Steep Streamside Slopes

- Identification:
  - slope gradient is greater than minimum inclination for geologic region
  - located within maximum distance (SMZ) from a watercourse for that region
  - has the potential to deliver sediment to a watercourse



# Headwall Swale



- Spoon-shaped slopes characterized by areas of narrow, steep, convergent topography located near the head of a Class II or III watercourse. Thick soils collect at the base of a steep swale along the axis of a valley and the concentration of runoff and subsurface flow make these areas prone to failure.

- Slope inclinations in these areas are typically upwards of 70% and greater with smooth to slightly irregular topography (historic scarps).

- May have seeps or springs near the base of the steep convergent slopes.

# Headwall Swales

- Identification
  - Field verification by trained and qualified personnel.
  - SHALSTAB with at least 10m DEM and areas that are at least  $\frac{1}{4}$  acre in size.
- Prescriptions
  - Single Tree Selection with even spacing.
  - Modification by on-site geologic review.

# DSL Prescriptions

- Scarp: No cut 25' above the main scarp
- May be modified by on-site geologic review
- Toe: No cut on toe extending 25' above toe
- if toe doesn't exist, apply appropriate standard prescriptions
- No Road construction w/o Geologic review

# Road Management Plan

- Transportation Plan - categorized truck roads into three classes:
  - Management roads
  - Temporary decommission roads
  - Permanent decommission roads
- Prioritization of sub-watershed road work units based on biological, geomorphic, and management criteria.
  - Lower Klamath River (30 work units)
  - Remaining portion of Green Diamond's covered area (29 work units)

# Road Plan Continued

- Assessment of road network beginning in the highest priority road work units
- Field assessment will identify and quantify road-related sediment sources and develop treatment prescriptions
- Prioritization for treatment based on:
  - Future sediment deliver ( $\text{yds}^3/\text{site}$ )
  - Treatment immediacy (event probability and sediment delivery)
  - Treatment cost-effectiveness ( $\text{\$/yd}^3$ )

# Road Plan Continued

- Implementation
  - Road upgrading
  - Temporary road decommissioning
  - Permanent road decommissioning
- Estimated volume of sediment delivery:
  - 6,440,000 yds<sup>3</sup> from high and moderate sites
- \$2.5 MM/year for the first 15 years to treat high and moderate sites
- Estimated 47% of the “Pile” treated in the first 15 years
- Remainder of the estimated sediment treated in 35 years



# Harvest-related Ground Disturbance

- New measures developed common to:

- Forestry Operations

- Harvesting systems

- Ground Based

- Skyline yarding operations

- Helicopter yarding operations

- Loading and landing operations

- Operating seasons:

- Summer: May 15<sup>th</sup> to October 15<sup>th</sup>

- Winter: October 16<sup>th</sup> to May 14<sup>th</sup>



# Monitoring Program

- Implementation
- Effectiveness



# Categories of Effectiveness Monitoring and Adaptive Management

- Rapid response monitoring (months up to 2 years)
  - Water temperature
  - Gravel permeability
  - Turbidity
  - Headwaters amphibian
- Response monitoring (minimum of 3 years)
  - Channel monitoring
  - Class III surface erosion
- Trend monitoring (long term)
  - Juvenile salmonid populations
  - Stream habitat assessments and LWD surveys
  - Road-related mass wasting
  - Hillslope mass wasting
- Experimental Watersheds Program and Adaptive Management



# Conservation Benefits

- Reduces sediment from roads and hillslopes
- Maintains cool water temperatures
- Provides effective stream buffers for in-stream wood recruitment
- Augments monitoring and establishes adaptive management feedback

